

# *Lupinus reitzii* (Fabaceae–Faboideae), a New Species of the *Lupinus lanatus* Complex from Southern Brazil

Mardiore Pinheiro and Silvia Teresinha Sfoggia Miotto

Depto. Botânica, IB-UFRGS, Campus do Vale, Porto Alegre, RS, Cep. 91.501-970, Brazil.  
mardiorepinheiro@brturbo.com

**ABSTRACT.** *Lupinus reitzii*, a new species from southern Brazil, is described and illustrated. The new species belongs to the *Lupinus lanatus* complex and is closely related to *L. lanatus* and *L. magnistipulatus*, from which it is set apart principally by the size and shape of the stipules and by the shape and pubescence of the leaflets.

**RESUMO.** É descrita e ilustrada *Lupinus reitzii*, uma nova espécie do Sul do Brasil. *Lupinus reitzii* é relacionada com os táxons do complexo *Lupinus lanatus*, especialmente *L. lanatus* e *L. magnistipulatus*, diferenciando-se destas principalmente pelo tamanho e forma das estípulas, forma e pilosidade dos folíolos.

**Key words:** Fabaceae–Faboideae, *Lupinus lanatus* complex, *Lupinus reitzii*, southern Brazil.

During a revision of the genus *Lupinus* L. in the Brazilian state of Rio Grande do Sul (Pinheiro & Miotto, 2001), we had the opportunity to study the type material of *L. magnistipulatus* Burkart ex Planchuelo & Dunn and verify that some of the paratypes present morphological differences from the isotype (Reitz 2377, HBR). In 1961, Burkart, while analyzing the collections Smith & Reitz 9155 (HBR) and 10135 (US, HBR), wrote on these sheets that they represented a new species, which he dubbed *L. reitzii*, but never validated the name (Pinheiro & Miotto, 2001). Later, Planchuelo and Dunn (1989) considered these collections to represent young individuals of *L. magnistipulatus* and referred them to this species. Our analysis of specimens determined as *L. magnistipulatus*, with additional collections from southern Brazil, indicates that a new species is represented among these collections and is herein described.

***Lupinus reitzii*** Burkart ex M. Pinheiro & Miotto, sp. nov. TYPE: Brazil. Santa Catarina: Varigão, BR 282, km 476, 31 Oct. 1999 (fl), M. Pinheiro 207 (holotype, ICN; isotypes, K, MBM, MO). Figure 1.

Herbae probabiliter biennes, erectae, secundum caules

ramosae. Folia basalia unifoliolata et trifoliolata, altera 5-foliolata, interdum folia trifoliata in ramis lateralibus; foliola late oblanceolata ad angusta oblanceolata, apice rotundato, marginibus undulatis, sparse utrinque lanosis, pili flavescentes, undulati et mixti; stipulae petiolo adnatae, parte distali libera, lanceolata vel lanceolato-caudata, apice acuminato, interdum acuto, dorsaliter lanosae, ventraliter glabrae. Racemi terminales, densiflori; bractae caducae, lanceolato-caudatae, dorsaliter lanosae, ventraliter glabrae. Flores rosei, roseo-purpureive vel colore indico tincti; calyx labio infero trifido, labio supero profunde bifido; alae oblongae, apice rotundato. Legumina lanosa; semina elliptica.

Plants probably biennial, herbaceous, erect, branched along the stem, (12)18.5–70 cm tall, sometimes in cushions more than 50 cm diam.; stem finely or densely lanate. Basal leaves unifoliolate and trifoliolate, evident only in juvenile plants; adult leaves sometimes trifoliolate in lateral branches, mostly 5- to 7(8)-foliolate; leaflets 3–8(9.5) × 1–3 cm, widely to narrowly oblanceolate, apically rounded, margins undulate, finely lanate on both sides, with sparse intertwined trichomes yellow-tinged, about 5–7 mm long; petioles 2.3–12.5(15) cm; stipules (11)18–70 mm, partly adnate to petioles, the free portion 8–38(49) × 3–9(13) mm, lanceolate to lanceolate-caudate, the apex acuminate, sometimes acute, glabrous adaxially, lanate abaxially. Terminal racemes, densiflorous, 25- to 50-flowered, 4.6–20.0 cm; peduncles (1.3)3–6.6(8.9) cm; rachis densely lanate; pedicels 1.5–4.7(6) mm, pilose as the rachis; bracts 10.7–16 × 2.1–4.2 mm, caducous, lanceolate-attenuate to lanceolate-caudate, lanate abaxially. Flowers 10–15.2 mm, pink, purple-pink, or indigo; bracteoles 2.5 mm long, lanceolate, rarely oblanceolate, glabrous within, finely to densely lanate outside; calyx glabrous within, finely to densely lanate outside; lower lip 11–14 × 2.7–4.5 mm, the apex trifid with central tooth 1.8–3.8 mm and lateral teeth 1.2–3.4 mm; upper lip deeply bifid, 6.3–9 × 4.1–6 mm; laciniae 1.8–2.8 mm wide, with a notch between them 4.1–6.9 mm deep; corolla with standard 13–16.8 × 7.8–12.3 mm, ovate, sometimes widely ovate or oblong-ovate; wings 13.5–18.4 × 4.7–7.6 mm, oblong, apex rounded, the claw 2.4–3.8 mm long;



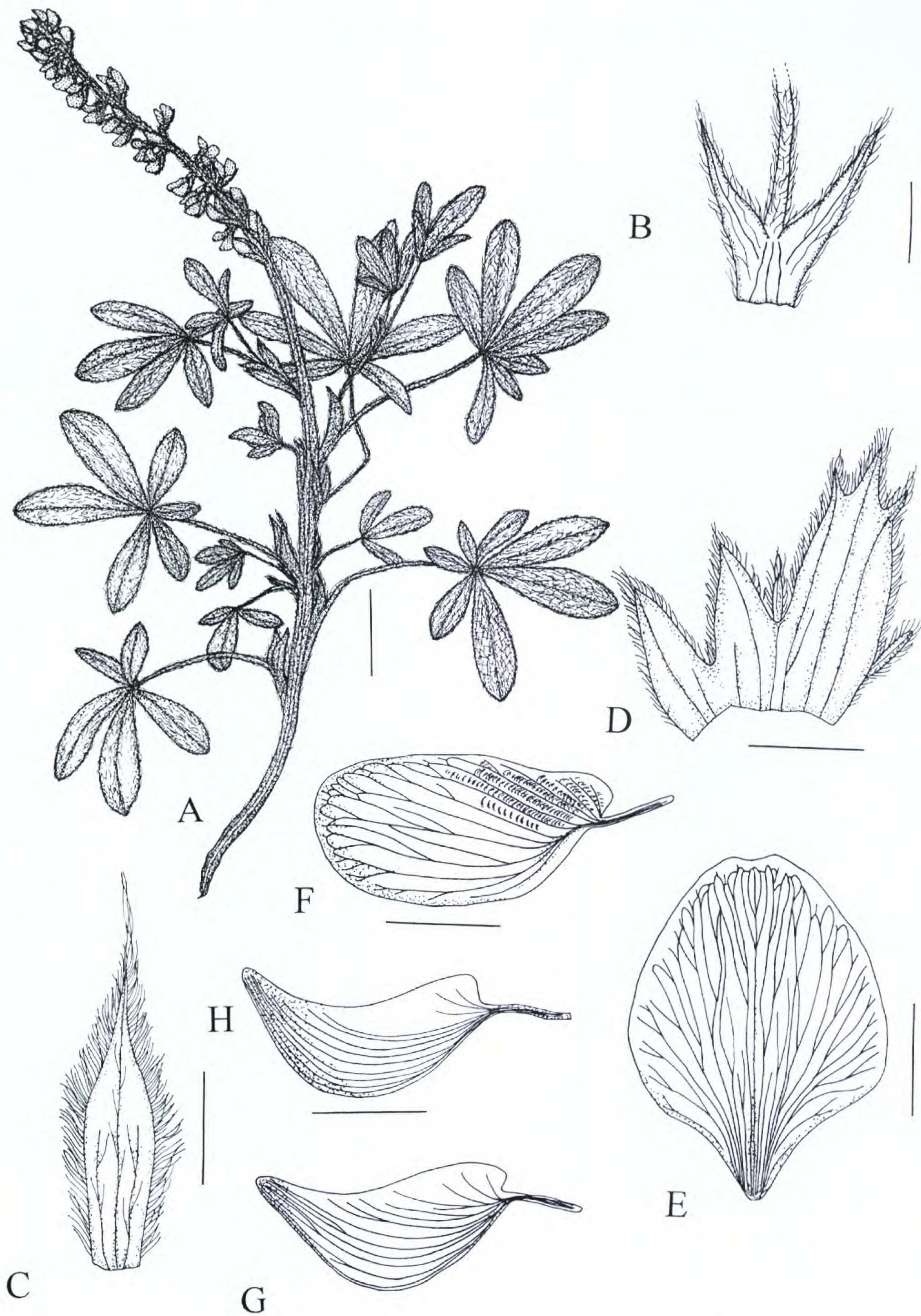


Figure 1. *Lupinus reitzii* Burkart ex M. Pinheiro & Miotto. —A. Flowering branch. —B. Stipules. —C. Bract, ventral view. —D. Calyx, inside surface. —E. Banner petal, ventral view. —F. Wing petal. —G, H. Keel petals. Scale bars = 4 cm in A; 2 cm in B; 5 mm in C–H. (A–G: drawn from the type, *M. Pinheiro* 207; H: *M. Pinheiro* 318.)



keels  $12.6\text{--}16.6 \times 3.8\text{--}5.4$  mm, the apex falcate, straight or twisted upward, rarely abruptly falcate-arcuate, the claw 3–4.5 mm long; ovary with 7 ovules. Legumes (33)43–64(74)  $\times$  7–9 mm, densely lanate; seeds  $4.2\text{--}4.6 \times 3\text{--}3.4$  mm, elliptic.

**Habitat and distribution.** *Lupinus reitzii* was collected in sunny places on roadsides and bare rocky soils in the southern Brazilian states of Rio Grande do Sul, Santa Catarina, and Paraná.

**Phenology.** Flowering and fruiting plants were collected from October to January.

**Etymology.** The epithet “reitzii” is an homage to Brazilian botanist Raulino Reitz.

Pinheiro and Miotto (2001), after a morphological analysis of the isotype of *L. magnistipulatus* (R. Reitz 2377, HBR) and the paratypes (*L. B. Smith*, R. Reitz & R. M. Klein 7703, HBR, US; *L. B. Smith* & R. Reitz 10326, HBR, R, US; R. Reitz & R. M. Klein 7417, HBR), verified that these were the only specimens examined by Planchuelo and Dunn (1989) which belong to *L. magnistipulatus*, while the other paratypes examined belong to *L. reitzii*. Moreover, Pinheiro and Miotto (2001), during the revision of *Lupinus* in Rio Grande do Sul, based on the morphological analysis (stipules, leaflets, banner, and calyx) of *L. magnistipulatus* and *L. setifolius* Planchuelo & Dunn, concluded that both species are the same taxon, justifying the synonymization of *L. setifolius*. It should be emphasized that in the holotype photo of *L. magnistipulatus* (R. Reitz 2377, SI), there are many notes written by Burkart, who indicated that this specimen is identical to the specimen *B. Rambo* 36208 (isotype, PACA), designated by Planchuelo and Dunn as the holotype of *L. setifolius*.

Planchuelo and Dunn (1989) considered the presence of trichomes on the leaflets a distinguishing characteristic to separate *L. magnistipulatus* (hairy leaflets) from *L. setifolius* (glabrous leaflets). However, the analysis of *L. magnistipulatus* populations demonstrated an intraspecific variation concerning their pubescence (Pinheiro & Miotto, 2001). Moreover, it can be emphasized that the description of *L. magnistipulatus* sensu Planchuelo & Dunn also includes vegetative and reproductive morphological characteristics of *L. reitzii*, which has hairy leaflets.

The analysis of the *L. magnistipulatus* and *L. setifolius* types, as well as of a great number of specimens, in addition to field observations, allowed a better understanding of these taxon circumscriptions and the adoption of *L. reitzii* as a new species.

*Lupinus reitzii* is closely related to *L. magnistipulatus* and *L. lanatus* Bentham. From *L. magnis-*

*tipulatus* it is set apart mainly through the morphology of the stipules and leaflets, as well as the flower color. The stipules in *L. reitzii* are lanceolate to lanceolate-caudate with an acuminate to acute apex, with the free part  $8\text{--}38(49) \times 3\text{--}9(13)$  mm, while in *L. magnistipulatus* they are lanceolate to ovate-lanceolate with an acute apex, the free part  $11\text{--}56.3 \times 4.4\text{--}22.0(25.2)$  mm; the leaflets in *L. reitzii* are widely to narrowly oblanceolate, both faces lanate with sparse intertwined yellow-tinged trichomes, while in *L. magnistipulatus* the leaflets are widely oblanceolate to obovate, glabrous or only occasionally lanose on both sides with sparse intertwined white trichomes. Flowers are pink to purple-pink, rarely indigo, in *L. reitzii*, while they are consistently indigo in *L. magnistipulatus*.

*Lupinus lanatus* differs from the new species by the densely white or whitened lanose, narrowly elliptic to elliptic-oblanceolate leaflets with plane margins and an obtuse or rounded apex, as well as the apices of the wings, which are rounded in *L. reitzii*, but have an obtuse beak in *L. lanatus*. The flowers in *L. lanatus* are blue or rarely white, contrasting with the pink, purple-pink, to deeper indigo of *L. reitzii*.

The geographical distribution of these *Lupinus* species is also distinct: *Lupinus magnistipulatus* is known from isolated scattered populations restricted to the montane fields from Rio Grande do Sul and Santa Catarina, in the highest and coldest environments of southern Brazil (Pinheiro & Miotto, 2001), while *L. reitzii* is widespread in southern Brazil; *L. lanatus* occurs in Santa Catarina and Rio Grande do Sul, where it is also widespread.

**Paratypes.** BRAZIL. **Paraná:** Guarapuava, Guará, 5 Dec. 1968, G. Hatschbach 20492 (MBM, US), H. Brücher 3065 (K); São José dos Pinhais, 18 Oct. 1980, G. Hatschbach 43218 (K). **Rio Grande do Sul:** Bom Jesus, estrada para São José dos Ausentes, 16 Nov. 1997, J. A. Jarenkow & E. N. Garcia 3635a (PEL); Cambará do Sul, de Osvaldo Kroeff, para São José dos Ausentes, 5 Jan. 2000, S. T. S. Miotto & M. Pinheiro 1844 (ICN); Itaimbezinho próx. de São Francisco de Paula, 13 Nov. 1953, Rambo 54507 (B, PACA); Caxias do Sul, Vila Oliva, 29 Oct. 1985, M. L. Abruzzi 1027 (HAS); São Francisco de Paula, 30 Oct. 1995, S. T. S. Miotto et al. 1456 (ICN); estrada para Serra do Umbu, 23 Oct. 1998, A. Flores 239 (ICN); ca. 11 km do rio Pinto, 23 Nov. 1998, M. Pinheiro 128 (ICN); São José dos Ausentes, em direção a Silveira, 6 Jan. 2000, M. Pinheiro 310 (ICN); Silveira, ca. 2 km em direção a Bom Jardim da Serra, 6 Jan. 2000, M. Pinheiro 313 (ICN). **Santa Catarina:** Água Doce, margem do rio Chapecó, 4 Dec. 1964, L. B. Smith & Klein 13552 (R); próx. à Caçador, 2 Dec. 1964, L. B. Smith & Klein 13393 (B, R); 14 km E de Bom Jardim da Serra, 25 Nov. 1980, A. Krapovickas & R. Vanni 36933 (CETS); Bom Jardim da Serra, 6 Jan. 2000, M. Pinheiro 318 (ICN); Caçador, Campos das Palmas, 52 km O de Caçador Joaçaba, 24 Dec. 1956, L. B. Smith & R. Reitz 9155 (HBR); Capão Alto, SC 458,



km 181, a 12 km do trevo da BR 116, 30 Oct. 1999, S. T. S. Miotto 1763 (ICN); Campo Belo do Sul, km 163, ca. 12 km da divisa com o mun. Campos Novos, 30 Oct. 1999, M. Pinheiro 198a (ICN); Lages, km 247, perímetro urbano, 2 Nov. 1999, M. Pinheiro 225 (ICN); Ponte Serrada, BR 282, km 450, 31 Oct. 1999, M. Pinheiro 205 (ICN); para Faxinal dos Guedes, 13 Oct. 1964, L. B. Smith & Reitz 12480 (FLOR, R); para Xanxerê, 8 Nov. 1964, L. B. Smith & Klein 13054 (US); Ponte Alta do Norte, BR 116, km 165, 02 Nov. 1999, M. Pinheiro 221 (ICN); São Cristóvão do Sul, BR 116, km 198, 2 Nov. 1999, M. Pinheiro 223 (ICN); São Joaquim, nascente do rio Capivaras, serra do Oratório, 10 km E de Bom Jardim da Serra, 16 Jan. 1957, L. B. Smith & Reitz 10135 (HBR, US), 22 Oct. 1961, G. Pabst 6220 & E. Pereira 6393 (HB, PEL); Vargão, BR 282, km 476, em direção a Faxinal dos Guedes, 31 Oct. 1999, M. Pinheiro 206 (ICN).

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